

Next Generation Modeling Technology for High Speed Rotorcraft, Phase I

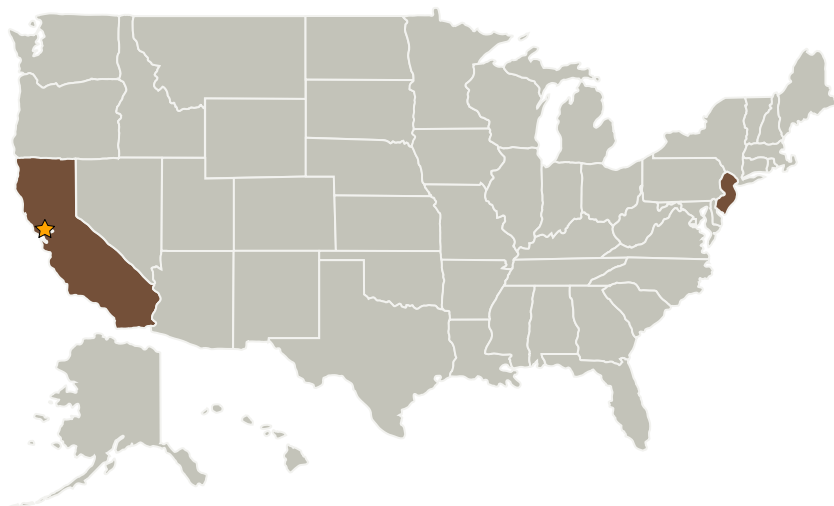
Completed Technology Project (2007 - 2007)



Project Introduction

Recent R&D associated with designing high speed rotorcraft has been greatly hampered by a lack of test data and confidence in predictions for rotors operating above advance ratio 1.0. This proposal outlines a plan for addressing this situation through a series of rotor tests and analytical enhancements. The three-pillared approach begins with a model rotor test in Phase I that will obtain essential data on autorotation characteristics of rotors operating at high advance ratio. The second pillar will involve analytical enhancements for comprehensive rotorcraft analyses featuring an improved yawed flow correction and an improved lifting surface blade model that will properly shed wake off the "leading edge" of blades operating as reverse velocity rotors. The third pillar will focus on improving grid generation methods for CFD solutions to appropriately model reverse and spanwise flow regions. Phase II will see additional rotor tests and model improvements followed by incorporation of new technology into a software module suitable for immediate implementation in rotorcraft analysis and flight simulation software. The new software module will provide a hierarchy of methods capable of modeling high speed rotorcraft blade aerodynamics for a broad spectrum of fidelity/speed requirements ranging from real-time flight simulation to high resolution CFD.

Primary U.S. Work Locations and Key Partners



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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Continuum Dynamics, Inc.	Supporting Organization	Industry	Ewing, New Jersey

Primary U.S. Work Locations

California	New Jersey
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
 - └ TX09.4 Vehicle Systems
 - └ TX09.4.5 Modeling and Simulation for EDL